guage, which is by no means an easy task. The last chapter, on the climate of the United States, is also quite extended, and will prove useful.

We might state our opinion of the volume in the following words: It is good, but it is not an *elementary* meteorology. Our author has succeeded in condensing a very great deal of information into his 372 pages, but for our part, we do not consider the book adapted for use in high schools. Some of the chapters can be easily understood, but certainly many of them would be difficult for anyone to appreciate thoroughly unless a pretty careful study of meteorology had preceded. Take, for instance, the chapter on the general circulation of the atmosphere, which, as already stated, is well done. We wish we could believe that our high school students, or even many of our college students, could thoroughly master that. We think our author has made a mistake in attempting to put so much information into this one volume, if his intention is to give an elementary presentation of the subject. It would be better to treat fewer matters, and to take each up at some length, than to attempt to include so many topics and necessarily dismiss many of them with a few words only. An elementary meteorology adapted to school use still remains to be written. Such a book, according to our way of thinking, should not attempt to cover nearly so much ground as has hitherto been the practice of writers of 'elementary' text-books of meteorology. It should devote far more attention to the instrumental side, to the study of weather maps, and to individual observations, both with and without instruments. Only after some such truly elementary knowledge concerning local phenomena has been gained can the student fully appreciate the larger facts which the general temperature, pressure, wind and rainfall conditions of the globe present.

What has been said regarding the non-elementary character of Dr. Waldo's book should not operate in the mind of the reader to detract from any of its merits as a text-book for the use of more advanced students. It will undoubtedly be widely read, and do a good work in disseminating sound meteorological learning.

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Lecture Notes on Theoretical Chemistry. By FERDINAND G. WIECHMANN, Ph. D., Columbia College. Second edition. Revised and enlarged. New York, John Wiley & Sons. 1895. 8°, pp. xviii+288.

The apparently growing tendency to divorce practical and theoretical chemistry is probably unfortunate for the training of the next generation of chemists. To study chemical phenomena without studying the principles of chemistry is much like relegating the student to the days when these principles were unknown; yet, in many of our modern text-books, every effort seems made to eliminate theory, as far as possible, and carry chemistry back to where botany was a few years ago, the study of a sufficient number of plant forms to enable the student to 'analyze' a flower. True, when one has acquired a good knowledge of general chemistry by several terms of study, it is desirable to go over the theoretical ground again and more extensively than it can be done in an elementary course, and for this purpose there are a number of excellent works not only in German, but also in English, and one at least by an American. Professor Wiechmann's work, however, covers a more elementary ground and is well fitted to accompany, rather than to succeed, college work on general chemistry. While it consists of 'Lecture Notes,' it is fuller than this title would indicate and might well be called an Elementary Treatise on Theoretical Chemistry. Undoubtedly, it would be a great advantage for a student to have before him the original lectures of which this book gives the notes; nevertheless the subject is set forth so clearly that the book has an independent value even as a text-book. It would be very helpful for all teachers of chemistry in secondary schools to have a good knowledge of its contents, and would be a great advantage to their teaching.

Chapter I. treats of matter and its forms, including solutions and change of state; chapter II. of the measurement of matter and specific gravity. The various methods of taking specific gravity and density are well classified and briefly described. Chapter III., the science of chemistry, is a brief introduction. Chapter IV., on chemical nomenclature and notation, is

an excellent historical resumé, quite full and very interesting to every student. Of the next chapter, on chemical formulæ and equations, less can be said; the writing of chemical equations cannot readily be reduced to rules. Atoms, atomic mass and valence are next taken up, and well epitomized; the periodic law is then briefly described, and the author well says: "Although the periodic law cannot as yet give a logical explanation of all these phenomena, still it stands unquestioned, that it is one of the most far-reaching, if it be not the most important law of chemistry." These two chapters, which condense the whole of Lothar Meyer's Moderne Theorie der Chemie, might have been wisely expanded to several times their volume without being disproportionate to the rest of the book. Molecules, molecular mass (including osmotic pressure), and the structure of molecules follow, and then a long chapter is devoted to stoichometrical calculations. Chemical arithmetic should certainly be thoroughly studied in 'practical' chemistry, yet the very fact of its being included in this book reflects a felt need. The concluding chapters are on energy: chemical energy (in which there is an excellent summary on measurement of chemical affinity) and photo-chemistry, thermal energy and thermo-chemistry, and electrical energy and electro-chemistry. The book closes with a quite complete bibliography of over two hundred titles of works relating to the material considered in the book, more than one-half published within the last decade.

The book is very free from typographical errors as well as from errors of statement. It is unfortunate that the terms specific gravity and density of gases should be used interchangeably; specific gravity is best used for air as the standard, and density confined to those cases where the unit is hydrogen.

Jas. Lewis Howe.

Washington and Lee University.

The Argentaurum Papers. No. 1. *Some Remarks Concerning Gravitation.* Addressed to the Smithsonian Institution, the American Association for the Advancement of Science, * * * and all learned bodies. By Stephen H. Emmens, member of the American Institute of Mining Engineers, etc. The Plain Citizen Publishing Co., New York.

It is not generally worth while for any one other than a psychologist or an alienist to look beyond the title page of so pretentious a work as this first installment of the *Argentaurum Papers.* But the author of this pamphlet of 150 octavo pages has contrived to exploit himself so extensively in the advertising columns of respectable journals, including Science,* that his work demands a brief notice.

The only part of the paper of any value is the 'Envoy,' which occupies the last twenty pages and gives the author's biography along with a list of his numerous publications. From this envoy it appears that in his academic days he was a prize man in chemistry, physics, logic and other subjects; that he has published treatises on pure and applied logic, Locke on the conduct of the human understanding, the philosophy and practice of punctuation, etc.; and also that he has published 'well-received' work in the domain of fiction. We learn with regret that he is at present a paralytic. "I have for the last nineteen years been paralyzed," he says, "by an injury to my spine, and am unable to move about with freedom." This might make us charitable, but he is too vigorous and clever a paralytic to implore any lenity; for he adds, stoically, "I do not say this by way of any excuse. No physical disability is a valid apology for bad work. Cripples must not *inflict* themselves upon other people."

As to the fate of his work he is fully resigned. He says: "I am prepared to be told, in the first place, that I am ignorant and foolish; that

* The insertion in Science of an advertisement of a book which we review so unfavorably may seem to need an explanation. In the contract with The Macmillan Co. the right is given to the responsible editor to veto any advertisement, but it is not desirable to use this power unless necessary. The author of the present book is said to have done good scientific work, and it would doubtless seem to him and to others like persecution not to permit him to bring his book to the attention of men of science. It is our duty to condemn the book according to our judgment, but the history of thought demonstrates that it is wrong to suppress freedom of speech or of publication. J. McK. C.